CLAIMS

1. A rotor configured for use with a vehicle alternator wherein the rotor rotates within and respect to a stator of the vehicle alternator, the rotor comprising a plurality of independent poles and permanent magnets circumferentially arranged in an alternating configuration such that each permanent magnet is positioned intermediate a pair of consecutive independent poles, the arrangement of the permanent magnets and independent poles defining an outer rotor perimeter and a central opening for receiving a shaft upon which the rotor rotates, each independent pole having a generally triangular cross-section that defines an apex portion that confronts the central opening and an end portion that forms a portion of the outer rotor perimeter, each permanent magnet having a reverse trapezoidal cross-section, a first end for confronting the central opening, and a second end that forms a portion of the outer rotor perimeter, each permanent magnet tapering from the first end to the second end, whereby the centrifugal force produced by rotation of the rotor radially pushes each permanent magnet away from the central opening and whereby the centrifugal force cooperates with the shape of the independent poles and permanent magnets to further improve the integrity of the lodgment of each permanent magnet between the corresponding pair of consecutive independent poles, the rotor being configured without any annular member being attached to the rotor about the rotor perimeter for holding the permanent magnets and independent poles in place.

2. The rotor according to claim 1 further comprising a pair of hubs, the permanent magnets and independent poles being positioned between the hubs, the independent

poles being attached to the hubs in such a manner that there is no interconnection between the apex portions of the independent poles so as to induce magnetization having a direction that is substantially orthogonal to the radius of the rotor.

3. The rotor according to claim 1 wherein the end portion of each independent pole defines a pair of lips that conforms to the locally defined curvature of the outer rotor perimeter, each lip abutting a corresponding permanent magnet.

4. The rotor according to claim 1 wherein each independent pole has an axially extending bore that is generally rectangular in shape and is sized for receiving a holding bolt that has a generally rectangular cross-section, the axially extending bore preventing rotation of the independent pole about the holding bolt and radial movement of the independent pole.

5. The rotor according to claim 4 wherein the independent poles and holding bolts are fabricated from relatively high magnetic permeable materials.

6. The magnet rotor according to claim 1 wherein each magnet is formed from a magnetic material chosen from ferrite, neodymium, ceramic and samarium-cobalt.

7. The rotor according to claim 1 wherein the independent poles are separated by a space that has a shape that conforms to the shape of a corresponding permanent magnet that is positioned within the space.

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8. An independent pole for use in a permanent magnet rotor having a central opening for receiving a shaft upon which the rotor rotates, an outer rotor perimeter, and at least two permanent magnets, the independent pole having a generally triangular cross-section that defines an apex portion that confronts the central opening and an end portion that forms a portion of the outer rotor perimeter.

9. The independent pole according to claim 8 wherein the end portion of each independent pole defines a pair of lips that conforms to the locally defined curvature of the outer rotor perimeter, each lip abutting a corresponding permanent magnet.

10. The independent pole according to claim 8 wherein each independent pole has an axially extending bore that is generally rectangular in shape and is sized for receiving a holding bolt that has a generally rectangular cross-section, the axially extending bore preventing rotation of the independent pole about the holding bolt and radial movement of the independent pole.

11. The independent pole according to claim 8 wherein each independent pole is fabricated from relatively high magnetic permeable materials.

12. A permanent magnet configured for placement between of a pair of consecutive independent poles of a rotor wherein each independent pole has a generally triangular cross-section and the rotor has a central opening for receiving a shaft upon which the

rotor rotates and an outer rotor perimeter, the permanent magnet having a reverse trapezoidal cross-section, a first end for confronting the central opening, and a second end that forms a portion of the outer rotor perimeter, the permanent magnet tapering from the first end to the second end.

13. The permanent magnet according to claim 12 wherein the permanent magnet is formed from a magnetic material chosen from ferrite, neodymium, ceramic and samarium-cobalt.

14. A rotor for an alternator, comprising at least two independent poles and at least two permanent magnets arranged in an alternating configuration such that each permanent magnet is positioned intermediate a pair of consecutive independent poles, the arrangement of the permanent magnets and independent poles defining an outer rotor perimeter and a central opening for receiving a shaft upon which the rotor rotates, each independent pole having a first end portion that confronts the central opening and a second end portion that forms a portion of the outer rotor perimeter, the second end portion of each independent pole having a pair of lips that conform to the locally defined curvature of the outer rotor perimeter, each permanent magnet having a first end for confronting the central opening and a second end that forms a portion of the outer rotor perimeter, each lip of the second end portion of each independent pole abutting a portion of the second end of a corresponding permanent magnet, whereby the centrifugal force produced by rotation of the rotor radially pushes each permanent magnet away from the central opening and whereby the centrifugal force cooperates

with the independent poles and permanent magnets to further improve the integrity of the lodgment of each permanent magnet between the corresponding pair of independent poles, each independent pole having an axially extending bore that is generally rectangular in shape and is sized for receiving a holding bolt that has a generally rectangular cross-section, the axially extending bore preventing rotation of the independent pole about the holding bolt and radial movement of the independent pole, the rotor being configured without a retaining member attached to the rotor about the rotor perimeter to retain the permanent magnets and independent poles in place.

15. The rotor according to claim 14 wherein each pair of consecutive independent poles are separated by a space that has a shape that conforms to the shape of a corresponding permanent magnet that is positioned within the space.

16. The rotor according to claim 14 wherein each permanent magnet has a reverse trapezoidal cross-section.

17. The rotor according to claim 14 wherein each permanent magnet has a generally rectangular cross-section.